Small Business Innovation Research/Small Business Tech Transfer

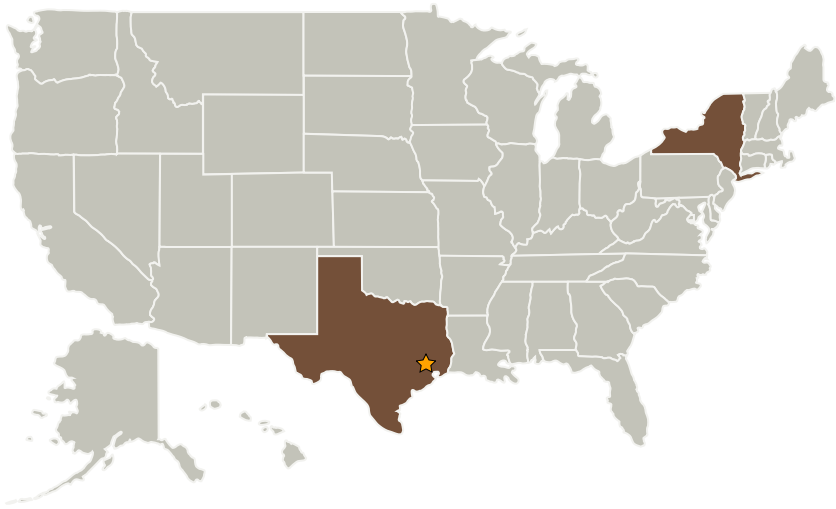
CNT-Based Smart Electrostatic Filters for Capturing Nanoparticulate Lunar Regolith, Phase I

Completed Technology Project (2007 - 2007)

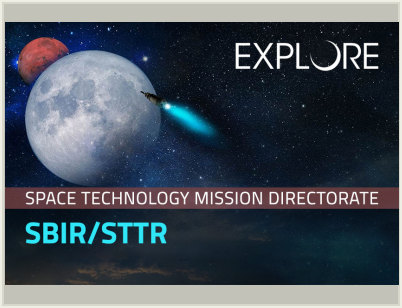
Project Introduction

The abrasive, reactive, and ubiquitous nature of lunar regolith created significant and serious problems during the Apollo moon missions. In this Phase I, Agave BioSystems, in collaboration with Dr. Randy Vander Wal of the Universities Space Research Association, propose to develop next generation smart filters using novel carbon nanotube (CNT)-based structures in electrostatic devices. Since CNTs have extremely high surface area, can function without the mass transfer limitations of traditional filtrations systems, and they can be charged to emit very high charge densities, they constitute an ideal material for integration into spacecraft air handling systems as electrostatic filtration components. The overall goal of this program is to build upon the unique structural and electronic nature of carbon nanotubes to create novel smart filters. By synthesizing the CNTs in situ on solid mesh supports and integrating them into a novel electrostatic particle collection unit, we aim to create novel filtration media capable of removing airborne lunar regolith from spacecraft airlock and cabin atmospheres.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Agave BioSystems, Inc.	Supporting Organization	Industry	Ithaca, New York



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

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Primary U.S. Work Locations	
New York	Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX07 Exploration Destination Systems
  - TX07.1 In-Situ Resource Utilization
    - TX07.1.2 Resource Acquisition, Isolation, and Preparation